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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,844	03/29/2004	Darren Kenneth Rogers	07620009C2	9117
48642	7590	12/13/2007	EXAMINER	
PHILIP D. LANE			TOOMER, CEPHIA D	
P.O. BOX 79318			ART UNIT	PAPER NUMBER
CHARLOTTE, NC 28271-7063			1797	
			MAIL DATE	DELIVERY MODE
			12/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/810,844	<b>Applicant(s)</b> ROGERS ET AL.	
	<b>Examiner</b> Cephia D. Toomer	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_ is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

### **DETAILED ACTION**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 2, 2007 has been entered.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 37-39, 42-45, 48-50, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joseph.

Joseph discloses a thermal protection system, which comprises a carbon foam. The carbon foam has an open-cell carbon structure, is produced from semi-crystalline coal-based materials, and has a density of from about 0.1 g/cm<sup>3</sup> to about 0.8 g/cm<sup>3</sup> (col. 3, lines 12-53). The open celled carbon foams can be impregnated with a petroleum pitch, epoxy resins or other polymers (col. 5, lines 59-65). Additionally, the carbon foam comprises a carbide, such as silicon carbide, that is bonded to the carbon foam as an antioxidant protective layer or incorporated into the foam (col. 7, lines 1-20, 40-48). A surface of the foam is also sealed in order to improve its adhesive or joining capabilities (col. 5, lines 16-25). Although there is no mention of abrasive applications, it is the examiner's position that due to the physical properties and porous structure, it would be reasonable to expect that the foam would be capable of being used for abrasive applications, and thus categorized as an abrasive foam.

Joseph does not disclose reactively bonded carbide or the relative amount, 1 to about 10% by volume, of the carbide included in the foam.

It is the examiner's position that the amount of carbide utilized is a result effective variable because changing it would clearly affect the type of product obtained. See MPEP § 2144.05 (B). Case law holds that "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

In view of this, it would have been obvious to one of ordinary skill in the art to utilize a suitable amount of carbide, including those within the scope of the present claims, so as to produce desired end results. The amount of carbide included in Joseph

would be chosen so that the desired oxidation protection afforded by the carbide would be produced and reactively bonds with the foam.

4. Claims 41, 47, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joseph in view of Kuzurman (Foam Materials Based on Silicon and Titanium Carbides).

The discussion of Joseph above is herein incorporated by reference.

Joseph is silent with respect to the carbide being titanium carbide.

Kuzurman discloses a porous foam produced by mixing carbon particles, binder, and finely dispersed powders of silicon or titanium into an initial mixture, and carbonizing and carbidizing the mixture. Therefore, it is the examiner's position that the foam disclosed includes a titanium or silicon carbide reactively bonded (paragraph 2).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to combine the teachings of Joseph and Kuzurman. Motivation lies in the fact that Joseph's foam includes generic carbide, whereupon Kuzurman's specific titanium carbide would read.

5. Claims 40, 46, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joseph in view of Googin ('440)

The disclosure of Joseph above is herein incorporated by reference.

Joseph is silent with respect to the carbide being tungsten carbide.

Googin discloses a foam comprising reactively bonded tungsten carbide (claims 6-10).

It would have been obvious to one of ordinary skill in the art at the time of application to combine the teachings of Joseph and Googin. Motivation lies in the fact that Joseph's foam includes a generic carbide, whereupon Googin's specific tungsten carbide would read.

6. Applicant's arguments have been considered but are not deemed persuasive.


Applicant argues that the examiner has confused a carbide reactively bonded to the open-cell carbon foam with free or existing carbide materials being added to a surface of carbon foam. Applicant argues that Joseph and Kuzurman or Googin disclose carbides that may be subsequently applied to a surface of the carbon as a protective layer.

In an alternative preferred embodiment, Joseph teaches that the carbide may be incorporated directly into the carbon foam (see col. 7, lines 40-48). While Joseph does not teach that the carbides bond to the foam structure during foam calcinations and graphitization process, it does appear that in Joseph's alternative preferred embodiment that the carbides reactively bond to the foam structure because Joseph teaches at col. 5, lines 41-58 that the additive may be added to the coal-based preforms either before or after expansion. It is the examiner's position that a prima facie case of obviousness has been set forth.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cephia D. Toomer whose telephone number is 571-272-1126. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Cephia D. Toomer  
Primary Examiner  
Art Unit 1797